IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW MEXICO

GRAND CANYON TRUST and SIERRA CLUB,

Plaintiffs,

v. **No. CIV 02-552 BB/ACT**

PUBLIC SERVICE COMPANY OF NEW MEXICO,

Defendant.

MEMORANDUM OPINION
ON DEFENDANT'S GENERAL DEFENSES

THIS MATTER is before the Court based on the Stipulated Order filed October 1, 2003. The Court having received evidence on November 17-19, 2003, and considered the briefs of the parties as well as their requested findings of fact and conclusions of law, enters this Memorandum Opinion as the Findings of Fact and Conclusions of Law of the Court.

Facts

This is a citizens' suit under the federal Clean Air Act, 42 U.S.C. §§ 7601-7671Q ("CAA"), brought by the Sierra Club and Grand Canyon Trust ("Plaintiffs") against Public Service Company of New Mexico ("PNM"). Plaintiffs allege that PNM violated

the opacity limit set in its Operating Permit ("Operating Permit") for Units 1, 3, and 4 of PNM's San Juan Generating Station ("San Juan").

PNM is a New Mexico corporation and is part owner and the operating agent for San Juan, which is located approximately 15 miles from Farmington, New Mexico. San Juan consists of four separate generating units that went on-line between 1973 and 1982 with a cumulative electric generating capacity of approximately 1,600 megawatts. It is a fossil fuel facility which generates electricity in a coal-fired boiler to create steam, and then passes that steam through a turbine to drive a generator. San Juan burns over six million tons of coal per year.

In the case of a coal-fired power plant such as San Juan, particulate matter emissions are made up primarily of tiny coal fly ash particles from the combustion process. Because increased particulates in a gas stream will generally cause an increase in the opacity of that gas stream, measurements of opacity can be a useful surrogate for determining when particulate levels are rising or falling. Many factors influence plume opacity readings, including particle density, size, distribution, and color.

The method historically used to measure the opacity of emissions is the periodic visual method recognized by the United States Environmental Protection Agency ("EPA") as Method 9. A Method 9 observation is performed by a human observer who is trained and certified to perform a visual measurement of the opacity of a gas

stream exiting the stack of an emissions source. A valid Method 9 reading requires at least 24 individual observations at 15-second intervals. To be certified, a reader's recorded observations can differ from the recently calibrated smoke meter readings by as much as 15 percent opacity on any single 15-second reading and by as much as 7.5 percent opacity on average (in terms of absolute error) for each category of 25 plumes. These variances are measured against an electronic opacity monitor which projects a beam of light across the stack and records the opacity.

Historically, the New Mexico Environment Department ("NMED") conducted EPA Method 9 tests at San Juan during annual or semi-annual inspections. After the 1990 amendments to the CAA, the EPA adopted regulations allowing continuous electronic monitoring ("CEM") of gas emissions. As a part of the electronic monitoring, state licensing authorities were then encouraged to require continuous opacity monitoring ("COM") under the Title V program.

The COMs in the stacks of San Juan consist of transmissometers that continuously measure the amount of light that can pass through the emissions of the power plant before such emissions are emitted into the atmosphere. These COMs are what are known as "dual pass" units that utilize a light source (or beam) on one side of the stack that is aimed at a mirror on the other side which reflects the light back to a sensor that is co-located with the light source. Causes of potential erroneous COMs readings include misalignment, dirty optics, and analyzer drift. The San Juan COMs

are designed to automatically readjust the monitor output in response to the allowed daily drift.

PNM records the average opacity of air pollutant emissions from San Juan by COM at six-minute intervals, except for periods of monitor downtime. The opacity data from the COMs is retained in a computer at San Juan. PNM is required to submit on a quarterly basis a written report to NMED that discloses each period of time in which opacity or emissions or pollutants from San Juan exceed the applicable standard ("quarterly reports").

The COMs generate printed data showing opacity readings expressed in percentage opacity on a six-minute block average basis to the nearest two decimal places. PNM identifies those readings from the COMs that show opacity in excess of 20 percent and submits quarterly reports to the NMED itemizing the readings in excess of 20 percent opacity together with a notation identifying the cause for the elevated reading. In instances where there is more than one opacity reading in excess of 20 percent in a given 24-hour period, PNM sometimes records the first six-minute period in excess of 20 percent opacity and the last recorded six-minute period in excess of 20 percent opacity and reports that all six-minute periods in between are at some level in excess of 20 percent opacity.

During the period covered by this suit, PNM experienced significant increases in its opacity measurements and reported "excess emissions" likely related, at least in

part, to the measurement of water vapor condensing on fly ash in the stacks following the installation of a wet limestone SO_2 control device. PNM notified the NMED in both the quarterly excess emissions reports and in separate correspondence that the condensation of water vapor was causing "higher than normal" opacity readings. Over time, PNM has continued to improve operator control to reduce the number of periods of "excess emissions" related to condensed water vapor.

Issues

Under the Stipulated Order, this phase of the proceedings is to be limited to: (1) the method for determining opacity compliance; (2) whether using COMs creates a more stringent opacity limit; (3) whether using COMs requires a showing that the readings are equivalent to EPA Method 9; (4) whether water vapor bias is a valid defense; and (5) whether startup, shutdown, and malfunction is a valid defense. Stip. Ord. ¶ 3A.

I. The Proper Method for Determining Opacity Compliance

Congress amended the CAA in 1990 to provide for "enhanced monitoring" compliance standards. 42 U.S.C. § 7313-14. "Thus, Congress expressed an intention to obligate major sources to a more stringent reporting standard." *Natural Resources Defense Council v. EPA*, 194 F.3d 130, 133 (D.C. Cir. 1999). In reaction to the congressional mandate, the EPA now requires "major sources" such as San Juan to install COMs as part of their Title V compliance. 40 C.F.R. 64.3(a) (1999). "The

science of CEMS is sound and the policy behind their adoption encourages reliability." Susan Norton, *Factors for Determining Validity of Evidence in Clean Air Act Litigation*, 15 J. Land Use & Envtl. L. 235, 273 (2000) The federal regulations were therefore amended to permit the use of COMs as "credible evidence" of violations of the CAA. *See* 62 Fed. Reg. at 8314, 8317-18, 8326-28 (1997). Shortly thereafter, these regulations were judicially recognized as consistent with the CAA's amended emission monitoring requirements. *Natural Resources Defense Council*, 194 F.3d at 137. For further discussion, *see* Arnold W. Reitze, Jr. and Steven D. Schell, *Self-Monitoring and Self-Reporting of Routine Air Pollution Releases*, 24 Colum. J. Envtl. L. 63, 126, 128 (1999).

The NMED became the CAA monitoring agency under a Title V operating permit program to which EPA gave final approval on November 26, 1996. 61 Fed. Reg. 60032. The reliability and proper use of COMs are recognized in the PNM Operating Permit for San Juan. That permit, although issued by the State, is known as a federal operating permit because it is designed to assure compliance with the requirements of the CAA. 42 U.S.C. § 7661c(a). The EPA regulations require "all state operating permits contain monitoring" to assure compliance with CAA standards. 40 C.F.R. 70.6(c)(1). Moreover, the EPA has expressly indicated that it expects the state enforcement agencies to determine the proper compliance assurance monitoring. 62 Fed. Reg. 54907. *See further* Robert J. Lambrechts, *MDNR's Toolbox for Encouraging Compliance: Title V Permits, Compliance Assurance Monitoring,*

***Periodic Monitoring, the Credible Evidence Rule and Compliance Certifications*, 9 Mo. Envtl. L. & Policy Rev. 1, 5 (2001) (hereinafter "Lambrechts") ("the question remains as to whether periodic monitoring is required in a given state, since the Title V Program is implemented at the individual state level").**

PNM was issued the most recent Operating Permit for San Juan on August 7, 1998. The PNM Operating Permit sets the maximum allowable opacity emission standard at 20%. (Pls.' Ex. 2 p. 13). Permit Condition 3.4.2.1 provides "in order to demonstrate compliance with 40 C.F.R. 60, Subpart D, Section 60.42(2)2, opacity shall be continuously monitored in accordance with Section 60.45(a)." (Pls.' Ex. 2 p. 15-16). Operating Permit Condition 3.2.1 allows a deviance over the 20% opacity limit for one six-minute period per hour of not more than 27 percent opacity.

This COM requirement was reemphasized when PNM specifically requested the NMED to specify what method was required by the San Juan Operating Permit for determining compliance with the opacity limits. By letter of October 30, 2002, the NMED Air Quality Bureau Chief, Sandra Ely, stated:

> **For opacity compliance determination methods the Department notes Condition 3.4.2.1 of Permit P062 itself, which states: "For opacity in order to demonstrate compliance with 40CFR60, Subpart D, Section 60.42(a)2, opacity shall be continuously monitored in accordance with Section 60.45(a)." We believe that the reference to "Section 60.45(a)" is a reference to Paragraph (a) of Section 45 of Part 60 of Title 40 of the Code of Federal Regulations, relating to continuous monitoring systems, and that a reasonable interpretation of the condition is that compliance**

> **with the opacity limits specified at 40 CFR 60.42(a)2 shall be determined using the continuous opacity monitoring specified at 40 CFR 60.45(a).**

Pls.' Ex. 6 p. 2 (emphasis added).

The State reaffirmed and reemphasized its position in its letter to PNM of September 12, 2003:

> **Condition 3.4.2.1 [of PNM's Permit] clearly reflects the Department's intent to establish COMs as the applicable compliance method for opacity. The condition cites the opacity limit, 40 C.F.R. 60.42(a)2, and requires the use of COMs "to demonstrate compliance." EPA reference Method 9 is not mentioned. Quite plainly, the Department established COMs - not EPA Method 9 - as the applicable compliance determination method for opacity.**

Pls.' Ex. 26 p. 3. Unless contrary to law, the Court should defer to the NMED's interpretation of the Operating Permit. *Gordon v. Norton*, 322 F.3d 1213, 1220 (10th Cir. 2003). Here, the NMED interpretation is not only the normal reading of the words, but is clearly consistent with the applicable federal regulation.

Indeed, it would appear that the electronic COMs are also accepted by PNM as the method for determining opacity compliance. While PNM continues to argue in favor of Method 9 as the accepted standard, the evidence is undisputed that no Method 9 test has been conducted at San Juan or submitted to the NMED for at least three years. If PNM actually thought Method 9 were the only accepted method of opacity measurement under its permit, the failure to conduct or submit an annual Method 9 test would itself be a violation. In lieu of Method 9 results, however, PNM consistently

sent quarterly reports of its COMs data to the NMED. It appears, then, in spite of its arguments, as a matter of operation even PNM accepts COM reports as the standard for measuring opacity compliance.

PNM argues that while the COM readings can be used to demonstrate opacity compliance, they may not legally be used to prove opacity violations. On its face this position presents a logical contradiction. Noncompliance is the logical converse of compliance. Lee E. Teitelbaum, *School Discipline Procedures - Some Empirical Findings and Some Theoretical Questions*, 58 Ind. L. J. 547, 583 (1984). "It follows that if such records [COM reports] are probative of compliance with the Act they are probative of the Act's violation." *Sierra Club v. Public Service Co. of Colo., Inc.*, 894 F. Supp. 1455, 1459 (D. Colo. 1995). Moreover, the PNM Operating Permit incorporates "40CFR60, Subpart D, Section 60.42(a)2" which specifically provides:

> **On and after the date on which the performance test required to be conducted by Section 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which exhibit greater than 20 percent opacity except for one 6-minute period per hour of not more than 27 percent opacity. (Emphasis added).**

The prohibitory phrasing of this regulation clearly establishes that the EPA contemplates COM readings be used as the standard for noncompliance as well as

compliance.[1] Under the CAA, it is the language of PNM's San Juan Permit which determines the method for determining compliance. *Natural Resources Defense Council*, 194 F.3d at 137. Under the clear language of Permit P062 as well as the NMED's interpretation, opacity compliance, or the failure thereof, may thus be measured by the COM readings.

2. Do COMs Create a More Stringent Opacity Limit than Method 9?

Since COMs are, then, a legitimate method for determining opacity compliance, the Court must address the remaining issues presented in the Stipulated Order. The second and third issues presented in that order are stated as "(2) whether using continuous opacity monitors (COMs) creates a more stringent opacity limit; (3) whether using COMs requires a showing that the readings are equivalent to EPA Method 9." Given the Court's understanding of the evidentiary record and the controlling Operating Permit, the Court considers these questions presently irrelevant.

COMs cannot create a "more stringent opacity" limit than Method 9 as the accuracy of the Method 9 readers who eyeball the opacity of the gas plume emitted from a plant is tested against COM measurements. *See III Quality Assurance Handbook for Air Pollution Measurement Systems*, EPA-600/4-77-027b, Stationary Source Specific Methods, Addition § 3.12; for further discussion, *see* Norton, 15 J.

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[1] *See further* Daniel Riesel, *Forecasting Significant Air Act Implementation Issues: Permitting and Enforcement*, 14 Pace Envtl. L. Rev. 129, 154 (1996); Reitze and Schell, 24 Colum. J. Envtl. L. at 128.

Land Use & Envtl. L. at 269-73. The qualitative standards for both tests is, then, the same since the tester's eyeball is "calibrated" by the COM.

It does appear likely that quantitatively COMs produce much more frequent and consistent results than Method 9. If this is considered "more stringent," then that is clearly what Congress intended by the 1990 amendments to the CAA. ***Natural Resources Defense Council*****, 194 F.3d at 133. The EPA clearly does not see the use of COM as increasing the standard [2] and analogizes the use of COMs to police radar guns; "To take a simple analogy, allowing the use of radar guns ... may raise the chance that a speeder will be detected, but this does not alter the legal stringency of a posted speed limit." 62 Fed. Reg. 8326. For further discussion,** ***see*** **Paul D. Hoburg,** ***Use of Credible Evidence to Prove Clean Air Act Violations*****, 25 B.C. Envtl. Aff. L. Rev. 771, 823 (1998). Compliance with EPA standards, then, may then allow COMs data be analyzed by Method 9 criteria (*e.g.*, opacity must exceed 23% for a minimum of 24 consecutive observations at 15-second intervals) before the EPA would even consider enforcement. Significantly, however, whether COMs are more stringent or are equivalent to Method 9 ignores the critical point that PNM's permit requires COMs**

[2] *See also* 62 Fed. Reg. at 8315, 8317-18, 8322-24; Reitze and Schell, 24 Colum. J. Envtl. L. at 130; Riesel, 14 Pace Envtl. L. Rev. at 155 (discussing 1996 EPA Compliance White Paper indicating the Agency will use other credible evidence only to pursue major violations); David Langer, *The Clean Air Act's Credible Evidence Rule: Achieving Greater Efficiency in Environmental Regulation*, 23 Vt. L. Rev. 673, 682-4 (1999); Lambrechts at 7-8.

to be used as the method of compliance.[3] How such COMs readings would compare to hypothetical Method 9 readings is therefore only of academic interest on this record.

3. Water Vapor

Having established Operating Permit P062 as the basis for COM compliance standard, it becomes necessary to examine this document to determine how "stringent" it is and measure the PNM data against it. Section 1.1.1 of the Permit provides:

> **"The permittee shall abide by all terms and conditions of this permit, except as allowed under section 502(b)(10) of the federal Act. Any permit noncompliance is grounds for enforcement single action; and may result in termination of this permit. Additionally, noncompliance with federally enforceable conditions of this permit constitutes a violation of the federal Act."**

As noted earlier, Permit § 3.4.2.1 also incorporates 40 C.F.R. 60, Subpart D, Section 60.42(a)2, which requires:

> **On and after the date on which the performance test required to be conducted by Section 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which exhibit greater than 20 percent opacity except for one 6-minute period per hour of not more than 27 percent opacity.**

The quarterly Title V Opacity Emission Deviation reports which Plaintiffs introduced into evidence (Exs. 3 and 4) contain significant evidence of emissions in

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[3] The first draft of the permit at issue in this case said that Method 9 was to be used for determining opacity compliance. The EPA, however, found that the draft permit failed to establish an appropriate method for determining opacity compliance. In response, PNM modified the draft permit to adopt COMs in Condition 3.4.2.1.

excess of 20% opacity. Using as an example the fourth quarter of the 1998 report on Unit 1, PNM has failed to adequately explain numerous log entries and why they should be excused under its Title V permit. On October 2, opacity readings higher than 60% occurred for more than 12 hours and were attributed to "High hoppers in ash conveying system." This occurred again on October 4, 5, and 6 with similar readings for similar periods. (Exhibit 3, p. 10). Readings between 30% and 56% occurred during November 7-8 and were again explained by high ash hoppers in combination with "water vapor in the stack." (*Id.)*

Uncombined water is not a regulated emission and indeed in an arid climate like New Mexico would likely benefit both the terrain and environment. Recognizing this, the Method 9 reader is required to read the plume at a point where water vapor is not present. 40 C.F.R. pt. 60 app. A § 2.3. Moreover, according to the EPA, such water vapor should be readily distinguishable by the trained observer. *Id.; see also Lloyd A. Fry Roofing Co. v. State*, 541 S.W.2d 639, 643 (Tex. Civ. App. 1976). Unfortunately, the way in which the San Juan units are configured requires the continuous opacity monitors be installed immediately above the wet limestone sulfur removal filters. And whatever visual ability a human observer may possess at a distance, the COMs in this position are unable to readily distinguish water vapor from particulates. The wet limestone process produces vast clouds which are generally opaque, but, because consisting largely of steam, not so rich in particulates as the opacity of the clouds

would suggest. PNM argues "opacity is not in these circumstances a good proxy for pollution." *See Bethlehem Steel Corp. v. EPA*, 782 F.2d 645, 654 (7th Cir. 1986). The issue, then, becomes whose burden is it to quantify what percentage of the opacity is a result of particulate matter and what percentage consists of what non-scientists call steam.

Since the Operating Permit and 40 C.F.R. 60, Subpart D, establish the basic standard simply as "opacity," the burden must shift to the party, here PNM, trying to explain why opacity as read by the COM is water and not the particulate matter which the CAA targets. *See Public Interest Research v. Elf Atochem North America, Inc.*, 817 F. Supp. 1164, 1177-8 (D.N.J. 1993); *Student Public Interest Research Group of New Jersey, Inc. v. Fritzsche, Dodge & Olcott, Inc.*, 579 F. Supp. 1524, 1538 (D.N.J. 1984), *aff'd*, 759 F.2d 1131 (3d Cir. 1985). Rather than produce Method 9 readings that could prove the opaque plume was water vapor rather than particulates, PNM produced two witnesses to testify only that water certainly must have contributed to the excess opacity readings.

PNM's Environmental Services Supervisor at San Juan, Mr. Mike Farley, testified that although he attributed many of the opacity readings that were over 20 percent to "water vapor," he had no idea how to determine opacity without the "water vapor" or whether it was in fact less than 20 percent by itself. Tr. 363-365. When asked to explain various readings and quantify the water vapor percentage, Mr. Farley

was unable to do so. In short, he was unable to quantify what portion of the opacity excess was caused by the fly ash particulate and what portion was water vapor.

PNM's expert witness, Dr. Grady Nichols, was also unable to provide any direct evidence that any of the readings greater than 20 percent would be less than 20 percent opacity but for water vapor. In particular, Dr. Nichols testified that in order to determine the effect of condensed, uncombined water droplets on any COM opacity reading one would need to know, at a minimum, the quantity, particle size and distribution, and chemical composition of such droplets. Dr. Nichols admitted he had no such information. Thus, Dr. Nichols was unable to demonstrate that any of the excess opacity readings were caused by water vapor. Tr. 475-7. Dr. Nichols did testify he could "guarantee" that none of PNM's excess opacity readings were entirely due to condensed water.[4]

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[4] Q. Understanding what you know of San Juan and its emissions, and as a scientist in the field, do you believe it's correct to characterize the entire 84.9 percent opacity as being caused by uncondensed water?

A. You can guarantee that it is not, because there will be some amount of fly ash emitted which will have some opacity of their own.

Q. And we don't know, therefore – turning back to my example that we did earlier this morning – where the opacity was at 30 percent, and then went to – 45, I believe was our example – due to the water droplet influence, whether this reading here of 84 may have – just searching for a term, but – a core opacity value or an opacity without condensed water present of greater than 20 percent; it may have a value of 30 or 40?

A. You don't know anything about it.

Tr. 484.

The Court is, thus, left in the unenviable position of recognizing that there is some likelihood that water vapor may have caused, or certainly contributed to, some of the opacity readings in excess of 20 percent, but having no factual record to determine when or why. *United States v. Turner*, 285 F.3d 909 (10th Cir. 2002) (record must contain evidence to support reliability of scientific findings). If PNM is going to explain a significant number of its opacity violations by relying on water vapor, it needs to devise some process to sample the water vapor and test it for dissolved or encased particulates. *See Bethlehem Steel* , 782 F.2d at 654.

4. ***Startup, Shutdown, and Malfunction***

The EPA operating permit rules allow an affirmative defense of "upset" based on an emergency if the permitting authority is notified of the event. 40 C.F.R. 70.6(g). The PNM quarterly reports frequently cite "upset in air flow through boiler and precipitator" and "start-up" as the explanation for numerous excess opacity readings.[5]

At the initiation of the evidentiary hearing, PNM represented that startup and shutdown readings were not being contested. (Tr. 6). Indeed, Plaintiffs did not contest that these are "legal excuses" and introduced no evidence or argument as to these opacity readings. (Tr. 10). The Court will therefore consider this issue moot.

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[5] (Exhibit 3, p. 2). The report on San Juan Unit #1 on October 11, 1998, cites an 87% opacity reading which lasted over 400 minutes and was explained as "unit start-up." *See also* October 31, November 13, 28, and December 29, 1998. (Exhibit 3, p. 10).

All tendered findings and conclusions not incorporated herein are deemed Denied.

BRUCE D. BLACK
United States District Judge